

M E M O R A N D U M

TO: LEE E. STANFORD (X2547)
FROM: JAMES M. CHOLAKIS (X2539)
DATE: MAY 7, 1990
RE: GENERAL BACKGROUND ON EBDCs
CC: DONALD J. KEMNA (X2545)

The ethylenebisdithiocarbamate (EBDCs) compounds are a class of chemicals used as agricultural fungicides.

These fungicides are characterized by the nature of their metallic salts, i.e., zinc, manganese, and combinations of manganese and zinc, corresponding to the pesticides Zineb, Maneb, and Mancozeb, respectively.

There is no evidence of human disease from chronic exposure to these compounds, however private organizations, i.e., the National Resources Defense Council (NRDC), the news media and certain environmental groups have created sufficient public pressure for the EPA to consider banning EBDCs in the U.S.

To avoid the adverse publicity like the Alar incident, and to protect valuable international markets, the EBDC manufacturers (i.e., Rohn & Haas) have voluntarily reduced the number of registrations for use of certain EBDCs from 55 crops to 13 crops in the United States. The EPA wants to reduce this to 10, but it has been suggested that ultimately EPA wants to totally ban EBDCs in the U.S. because of this intense pressure from "environmentalists."

Scientifically, EBDCs have been the subject of much debate for the last 30 years. This debate is based on the fact that a breakdown product of EBDCs is ethylene thiourea (ETU). ETU is formed from EBDC's in vivo, in the environment, and during the cooking of foods that may contain residues of EBDC. Under experimental conditions, ETU has been shown to be carcinogenic and teratogenic in laboratory animals. On the other hand, EBDCs administered in chronic animal studies have not shown a positive tumorigenic response. However, the real basis of the scientific controversy is that in chronic studies performed with ETU, the carcinogenic response observed with ETU was an extension of its

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goitrogenic activity (hormonal stimulation). Toxicologists contend that regardless of ETU's animal carcinogenic activity, any human exposure to EBDCs would be manifested first by clinical thyroid symptoms prior to any potential carcinogenic activity. Thyroid symptoms and thyroid cancer has never been observed under clinical conditions or reported in epidemiology studies. These views are expressed in more detail by the scientific advisory group coordinated by Rohn & Haas in their response to a EPA Position Document. (Summary Appended)

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